REMARKS

Claims 1-7 remain in this application. Claims 1-4 are rejected. Claims 5-7 are objected to. Claims 1, 2, 4-6 are amended herein to clarify the invention, and to address matters of form unrelated to substantive patentability issues.

Applicants respectfully request that the Examiner acknowledge receipt of the priority document filed in this application on April 9, 2001.

The title is objected to in the Office Action as being nondescriptive. The title is amended to read "RECHARGEABLE BATTERY WITH TEMPERATURE CONTROLLED SWITCH" to overcome this objection. It is respectfully submitted that the amended title is sufficiently descriptive. Applicant respectfully requests that the objection to the title be withdrawn.

Claims 1 and 4 are objected to for improper use of the term "thereby." The use of the term "thereby" in setting forth a function is proper where the function necessarily results from the structure in the claim. Claim 4 recites structure which necessitates the functions recited in the "thereby" clauses. However, in the interest of furthering prosecution, use of the term "thereby" in both claims 1 and 4 is removed. Withdrawal of the objection is respectfully requested.

Claims 4-7 are rejected as indefinite under 35 U.S.C. § 112, second paragraph, for failing to particularly point out and distinctly claim the subject

matter of the invention as a result of the use of the terminology "ring-like" The claims are amended to change "ring-like" to "ring shaped" which is intended read on any shape which defines an aperture. Therefore, reconsideration of the rejection of claims 4-7 and their allowance are earnestly requested.

Claims 1-4 are rejected under 35 U.S.C. § 102(b) as being anticipated by the Quinn reference. Applicant herein respectfully traverses these rejections. "Anticipation requires the presence in a single prior art reference disclosure of each and every element of the claimed invention, ***arranged as in the claim.***" ***Lindemann Maschinenfabrik GmbH v. American Hoist & Derrick Co.***, 221 USPQ 481, 485 (Fed. Cir. 1984) (emphasis added). It is respectfully submitted that the cited reference is deficient with regard to the following.

Claims 1 and 4 both require that the switch effects a short circuit across the battery's electrodes in response to a temperature. Quinn fails to teach such a feature. The Quinn reference teaches a switch blade 40 which moves from a closed position which effects external connection to the battery to an open position which does not effect the claimed short circuit of the present invention. Col. 6, lines 23-35. The other embodiments of the Quinn reference similarly lack the short circuit feature of thee present invention.

The short circuit feature of the present invention provides an important advantage over the cited art. If a battery is left in an overcharged state at a raised

temperature, leakage of electrolyte is likely to occur which deteriorates the battery and may damage the device which the battery is used in. The short circuit feature alleviates the overcharged condition.

In view of the above, it is respectfully submitted that claims 1-4 particularly describe and distinctly claim elements not disclosed in the cited reference. Therefore, reconsideration of the rejections of claims 1-4 and their allowance are respectfully requested.

Claims 5-7 are objected to as being dependent from rejected base claims. The Examiner indicates that the claims contain allowable subject matter and would be allowed if put in independent form incorporating the limitations of the base and intervening claims and if amended to overcome the above indefiniteness rejection. The claims are amended in accordance with the Examiner's suggestion. Reconsideration of the objection and allowance of the claims are respectfully requested.

For the convenience of the Examiner, APPENDIX II is provided herewith having a complete set of pending claims with all amendments effected therein.

Applicant respectfully requests a one month extension of time for responding to the Office Action. Please charge the fee of $110.00 for the extension of time to Deposit Account No. 10-1250.

In light of the foregoing, the application is now believed to be in proper form for allowance of all claims and notice to that effect is earnestly solicited. Please charge any deficiency or credit any overpayment to Deposit Account No. 10-1250.

Respectfully submitted,
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APPENDIX I

AMENDED CLAIMS WITH AMENDMENTS INDICATED THEREIN BY BRACKETS AND UNDERLINING

1. (Amended) A non-aqueous electrolyte rechargeable battery, comprising:

an element for electromotive force including a positive electrode and a negative electrode;

a battery case for accommodating the element for electromotive force therein; and

a switch element attached to the battery case and interposed in a circuit for connecting the battery to an external power source in an initial state of operation, the switch element [being operable] operating, in response to a first change in temperature of the battery, [thereby disconnecting] to disconnect the battery from the circuit and [establishing] establish a short circuit across the positive electrode and the negative electrode in a second state of operation, the switch element [being capable of restoring to its] further operating to return to the initial state in response to a second change in temperature of the battery opposing that of said first change in temperature.

2. (Amended) The non-aqueous electrolyte rechargeable battery according to Claim 1, wherein the switch element includes :

a temperature-sensitive element;

a first conductive plate connected to one of the positive electrode and the negative electrode and disposed on one side of the temperature-sensitive element; and

a second conductive plate connected to the other one of the positive electrode and the negative electrode disposed on the other side of the temperature-sensitive element opposite from the first conductive plate, wherein

the temperature-sensitive element is in contact with either one of the first conductive plate and the second conductive plate in the initial state of operation, and deforms to contact the other one of the first conductive plate and the second conductive plate in the second state of operation in response to a change in temperature of the battery.

4. (Amended) A non-aqueous electrolyte rechargeable battery comprising:

an element for electromotive force including an electrode of first polarity and an electrode of second polarity;

a battery case having an open top end for accommodating the element for electromotive force, and being electrically connected to the electrode of first polarity; and

a closure assembly for closing the open top end of the battery case, including an external terminal, an internal terminal electrically connected to the electrode of

second polarity, a switch element [in electrical contact with both of] electrically connecting the external terminal and the internal terminal in an initial state, and a [ring-like] ring shaped conductive element electrically connected to the battery case and an electrical insulation electrically [insulated] insulating the ring shaped conductive element from both of the external terminal and the internal terminal [, wherein];

the switch element [disconnects itself] being responsive to a first temperature change to break connection to [from] the external terminal and [makes] effect electrical contact with the [ring-like] ring shaped conductive element to establish a second state of operation [in response to a change in temperature of the battery], [thereby] breaking electrical connection between the battery and an external power source and establishing a short circuit to cause the battery to discharge[,] ; and [wherein]

the switch element being responsive to a second temperature change, opposing said first temperature change, to return to the [restores to its] initial state [in response to a change in temperature of the battery], [thereby] re-establishing electrical connection between the battery and the external power source.

5. (Amended) [The] A non-aqueous electrolyte rechargeable battery [according to Claim 4], comprising:

an element for electromotive force including an electrode of first polarity and an electrode of second polarity;

a battery case having an open top end for accommodating the element for electromotive force, and being electrically connected to the electrode of first polarity; and

a closure assembly for closing the open top end of the battery case, including an external terminal, an internal terminal electrically connected to the electrode of second polarity, a switch element electrically connecting the external terminal and the internal terminal in an initial state, and a ring shaped conductive element electrically connected to the battery case and an electrical insulation electrically insulating the ring shaped conductive element from both of the external terminal and the internal terminal;

the switch element being responsive to a first temperature change to break connection to the external terminal and effect electrical contact with the ring shaped conductive element to establish a second state of operation, breaking electrical connection between the battery and an external power source and establishing a short circuit to cause the battery to discharge; and

the switch element being responsive to a second temperature change, opposing said first temperature change, to return to the initial state, re-establishing electrical connection between the battery and the external power source.

wherein the electrical insulation between the [ring-like] ring shaped conductive element and the external terminal and the internal terminal is effected by a [ring-like] ring shaped gasket disposed on an inner peripheral side of the [ring-like] ring shaped conductive element, the external terminal and the internal terminal being arranged on an inner side of the [ring-like] ring shaped gasket, the [ring-like] ring shaped conductive element having an inwardly extending protrusion passing through a hole formed in the [ring-like] ring shaped gasket towards between the external terminal and the internal terminal.

6. (Amended) The non-aqueous electrolyte rechargeable battery according to Claim 5, wherein the switch element makes contact with the protrusion of the [ring-like] ring shaped conductive element to form the short circuit.